6 Soft Proofing & Media

How to set up your monitor for accurate image proofing

- How to proof your images on your monitor
- Printing your photos yourself
- What you need to know about soft proofing when getting prints from a service provider
- What you should consider when printing on paper, canvas, and film

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Soft Proofing

Pitfalls in the assessment of images on the screen

Assessing images on the monitor appears easy at first glance, but this is not necessarily the case, especially for users with limited experience in image processing, as they're apt to make incorrect assumptions about photos on screen. After all, what appears to be excellent, even on on a calibrated monitor, may prove to be disappointing when printed. This happens because:

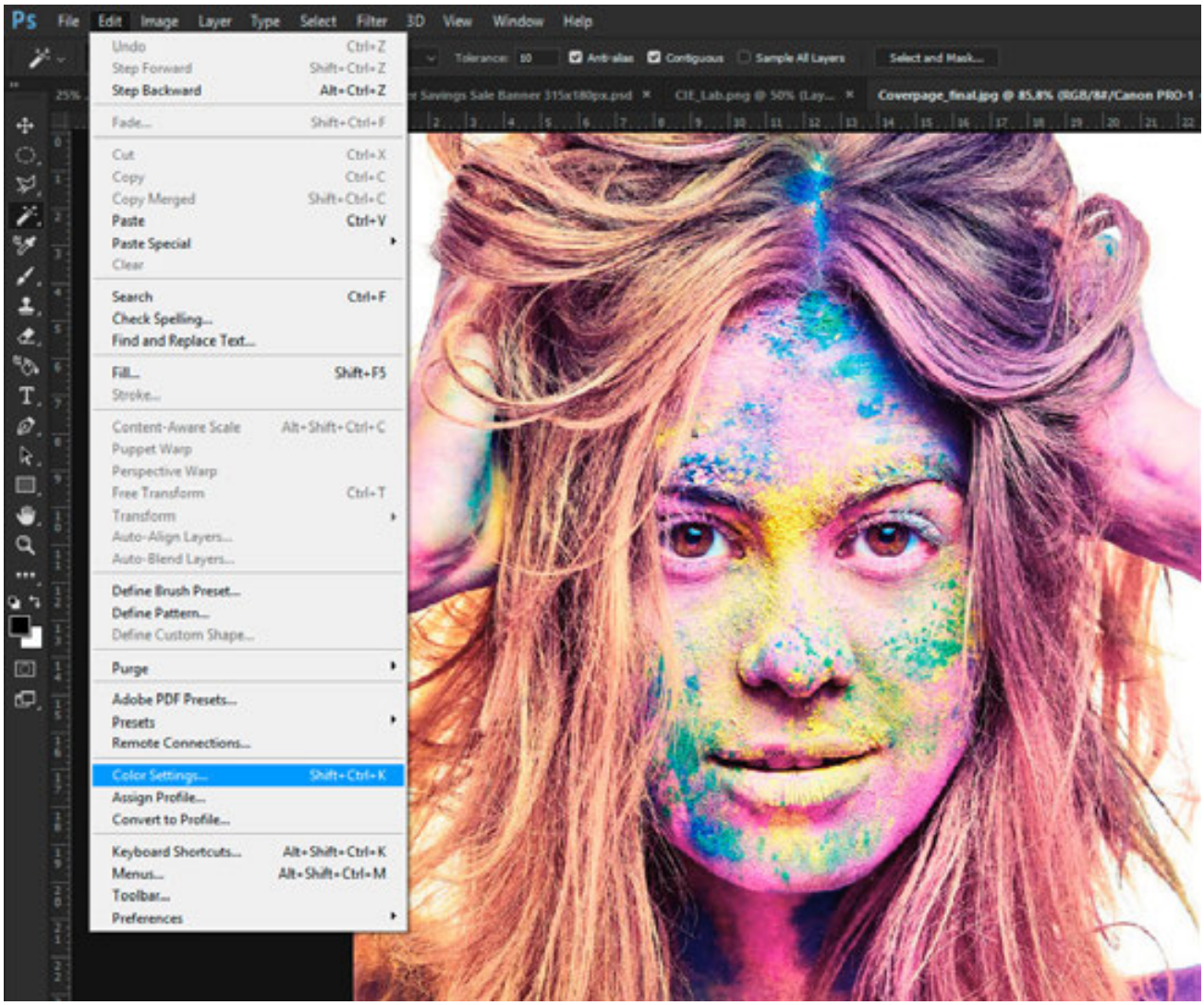
- Colors may change, to fit the printer's gamut
- Images print darker than they display on screen
- Details that show in shadow areas on the monitor disappear in print
- Odd dither patterns sometimes occur in flat areas
- Image contrast may dissolve into an indeterminate gray
- Colors may lose their luminance and saturation

The tool that can help

Technology comes to your aid: with advanced imaging apps, you can not only display the original RGB version of your images, but also simulate a printer, ink, and paper version. In contrast to paper or film press proofs, types of hard proofs, the version on screen is called a soft proof.

Color Settings in Photoshop

Using color spaces



In Photoshop under the “Edit” menu there are color setting options.

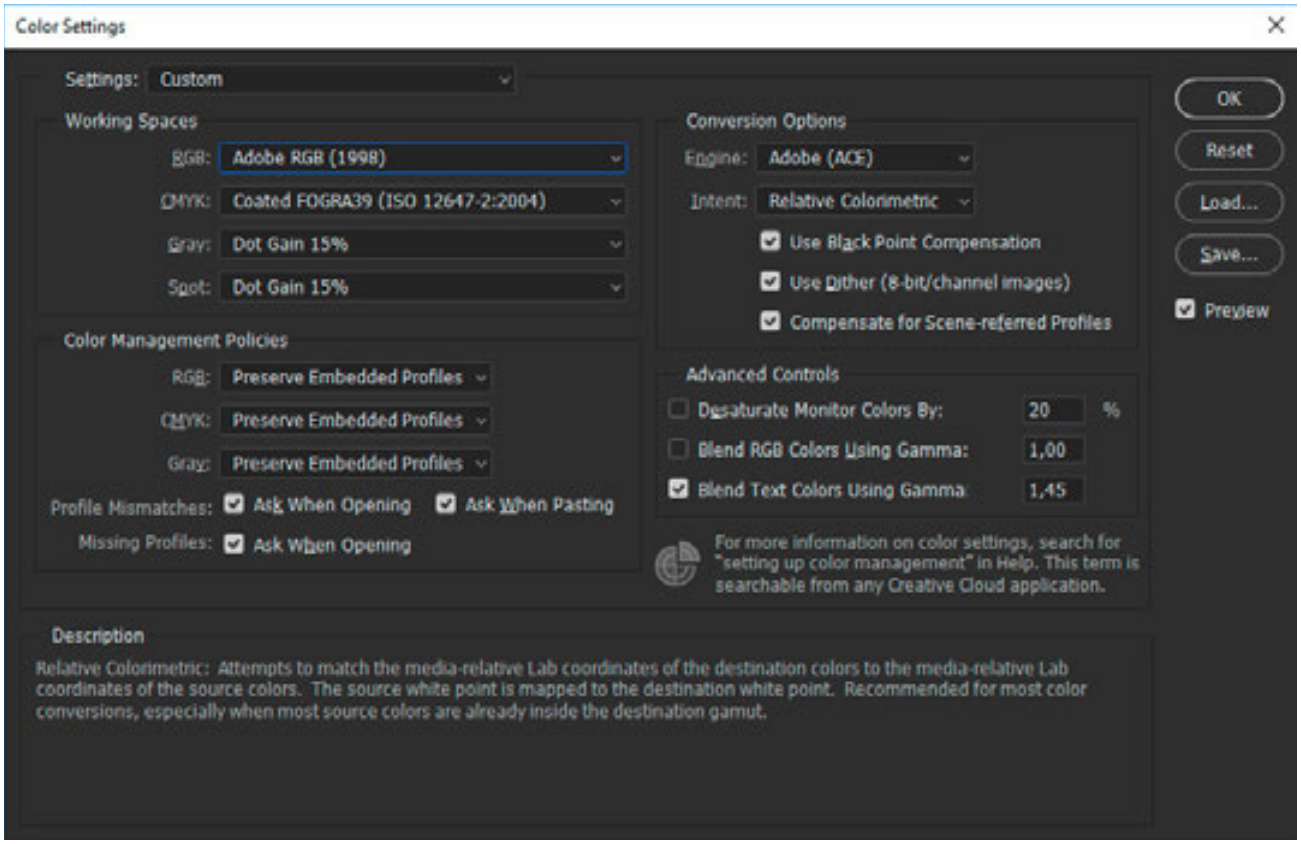
Once you have generated a monitor profile, the display is managed through the system's internal color management, under both Windows and Mac. Select a working color space when converting your RAW files. It is also recommended to select the same color space in the Photoshop color settings to avoid unnecessary warnings.

TIP

It is important that you do not randomly convert back and forth between different color spaces, because color data is lost during each conversion, especially when different gammas are involved.

Photoshop's Color Settings menu

Here we go into more detail on the color settings menu. We do not describe all menu items in the user interface, however, there is a brief description at the bottom of the menu window for each item.


Color Settings
Settings: Custom
Working Spaces
RGB: Adobe RGB (1998)
CMYK: Coated FOGRA39 (ISO 12647-2:2004)
Gray: Dot Gain 15%
Spot: Dot Gain 15%
Color Management Policies
RGB: Preserve Embedded Profiles
CMYK: Preserve Embedded Profiles
Gray: Preserve Embedded Profiles
Profile Mismatches: Ask When Opening Ask When Pasting
Missing Profiles: Ask When Opening
Conversion Options
Engine: Adobe (ACE)
Intent: Relative Colorimetric
Use Black Point Compensation
Use Dither (8-bit/channel images)
Compensate for Scene-referred Profiles
Advanced Controls
Desaturate Monitor Colors By: 20 %
Blend RGB Colors Using Gamma: 1,00
Blend Text Colors Using Gamma 1,45
For more information on color settings, search for "setting up color management" in Help. This term is searchable from any Creative Cloud application.
OK
Reset
Load...
Save...
Preview
Description
Relative Colorimetric: Attempts to match the media-relative Lab coordinates of the destination colors to the media-relative Lab coordinates of the source colors. The source white point is mapped to the destination white point. Recommended for most color conversions, especially when most source colors are already inside the destination gamut.

The Color Settings options in Photoshop's Edit menu.

Working Space

RGB: Here you set your preferred working space. This should be at least large enough for the type of output you create. Web-only users may select sRGB, but AdobeRGB is more flexible for multiple uses. For high-quality camera models, set AdobeRGB in-camera for JPGs; RAW images will be converted to your working space on import.

CMYK: Here you set the standard color space for a CMYK workflow, if you use one. Ask your print service provider which standard they use. Gray choices can be made for your own grayscale work, or for service provider needs. You can also activate softproof functions for these spaces in the menu bar under "View / Check Color".

Color Management Policies:

At this point we have defined the color spaces for RGB, CMYK and Gray, and how to handle the color space of an image file when we load it in Photoshop. From here, you have a few further choices.

- Turn off color management: In this case, the image is simply displayed in the color space of the monitor. Be careful, as any attached color profile is removed.
- Preserve embedded profile: You should use this setting to retain full control.
- Convert to RGB working space: Choose this option if you want to include and process image files from sources with a different color space in your workflow. For example, you may want to paste an object from a picture you made with your phone into one of your pictures. In this case, this setting ensures correct color conversion.
- Profile Mismatches & Missing Profiles: definitely check this box, so you will be asked when opening an image file which of the first three options you prefer.

Conversion Options:

- **Engine:** Here you can choose between Adobe Color Engine(ACE) Adobe CMM, or a few other choices. ACE is preferred, as this engine is used in all Adobe programs.
- **Intent:** Please see Chapter 5 for more information on different rendering intents.

INTERESTING ONLINE FINDS

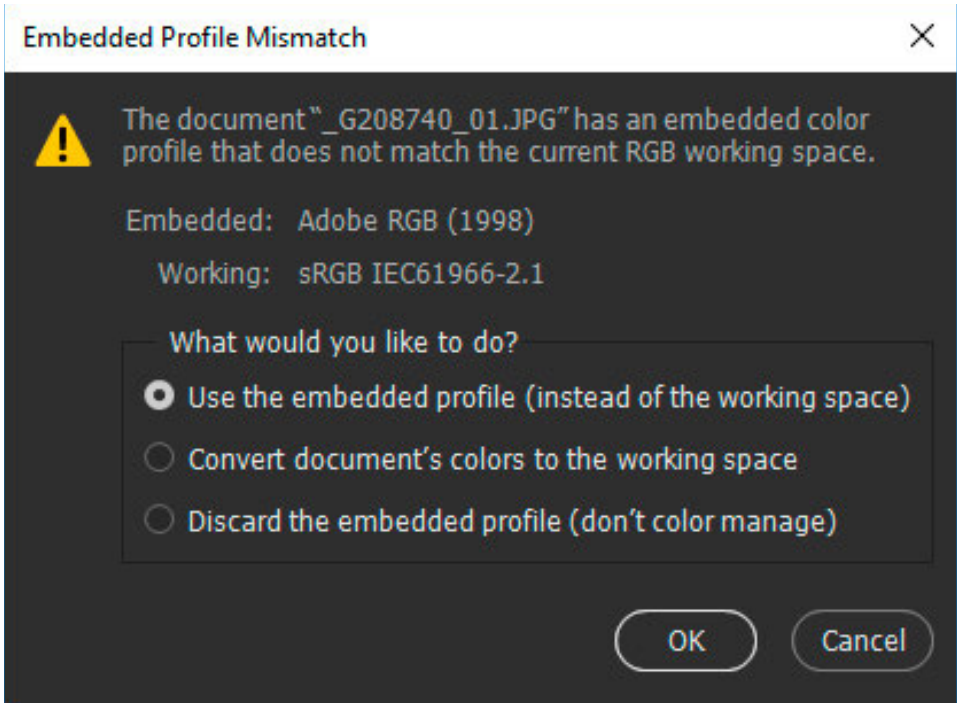
Read this article from Adobe to learn more about color settings.

Read Article

Conversion Settings

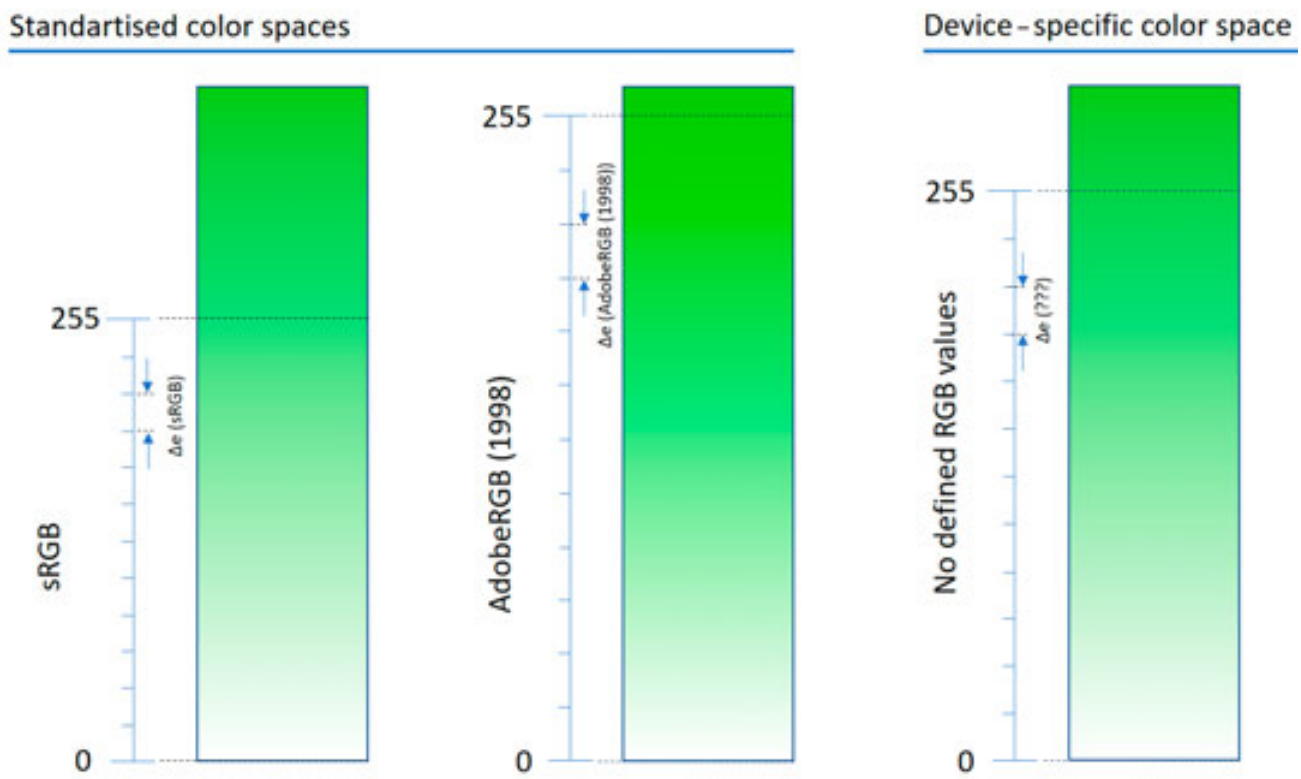
What's best in this case

f you have defined your working space, you may open image files that were created in another RGB color space. In these cases, a warning message appears asking you to select a color space. **Typically, maintain the embedded color space of the file.** If necessary, convert to another working space using Photoshop's Convert to Profile function in the Edit menu.


Embedded Profile Mismatch
The document "_G208740_01.JPG" has an embedded color profile that does not match the current RGB working space.
Embedded: Adobe RGB (1998)
Working: sRGB IEC61966-2.1
What would you like to do?
Use the embedded profile (instead of the working space)
Convert document's colors to the working space
Discard the embedded profile (don't color manage)
OK
Cancel

This warning message appears each time you open an image in Photoshop, provided that you have activated this feature in the color settings, and the image has a different color space than the working space.

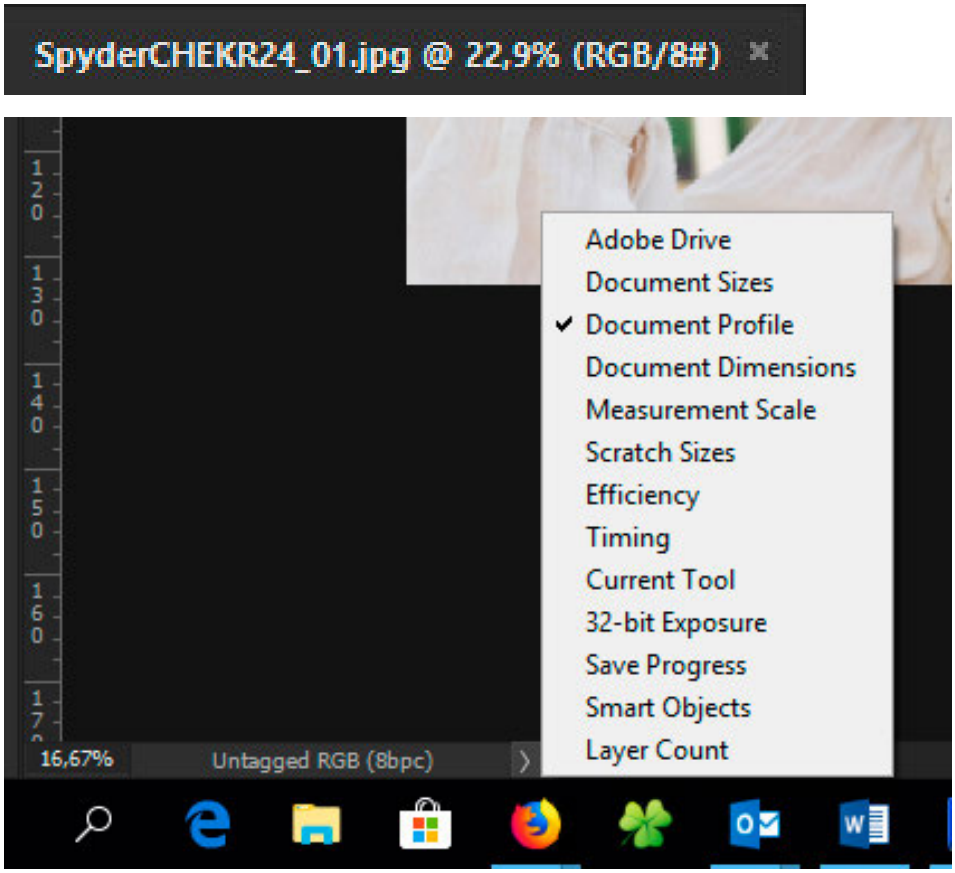
Typically, keep the embedded color space of the file. If you load an image that does not have a profile, open it without using color management. In this case, Photoshop displays the image in the device color space (meaning the space of your monitor). If necessary, tag a working space using Photoshop's Assign Profile feature. This option can be found in the "Edit" menu.



In this graphic, we contrasted the standard color spaces sRGB and AdobeRGB with a device color space. The latter is different from device to device and thus arbitrary. Preparing images for printing in device color is always risky.

TIP

You may have wondered why Photoshop displays a diamond or asterisk in the file name of the open image. For example, "Filename.jpg @ 16.7% (RGB / 8 #)." % Indicates the magnification state, RGB the color model, 8 represents the bit depth, in this case 8 bit/channel and the # indicates that your image does not contain a profile. If an * is displayed, it means that a profile has been assigned.



Additional information that Photoshop displays with an open image. At the bottom left of Photoshop's workspace, more detailed information about the file can be found.

The difference between Convert to Profile and Assign Profile

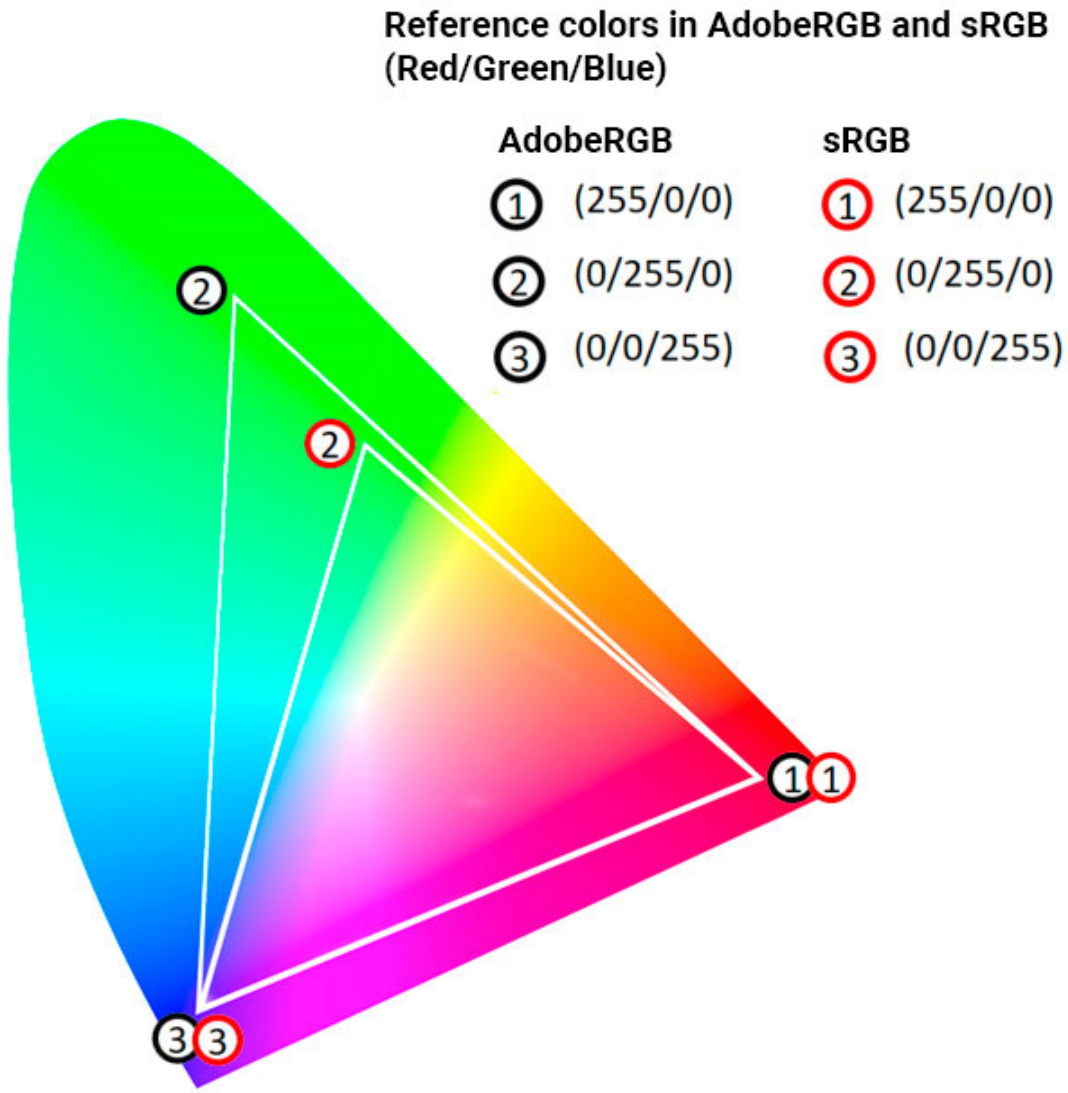
The difference between the two is best explained as follows:

Convert to Profile: 16 km > 10 miles (the numeric value is converted according to the unit). Applied to color, this means that the visual color is maintained as much as possible, by converting the RGB values. Used for color accurate conversions.

Assign profile: 16 km > 16 miles (the assigned unit is changed but the numeric value is not adjusted). Applied to color, this means that the RGB values are maintained, but the visual color changes. Used when the existing color profile tag is incorrect, or to maintain smooth graphic gradients, at the cost of exact color.

INFO

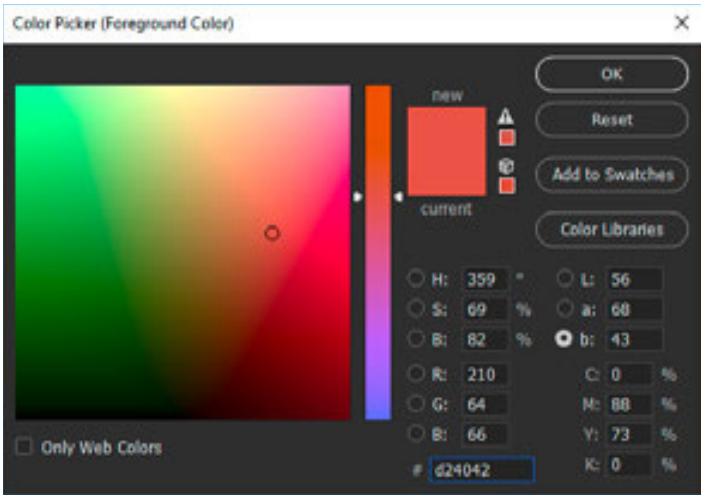
For the colors, visually, to remain the same, use the Convert to Profile option.



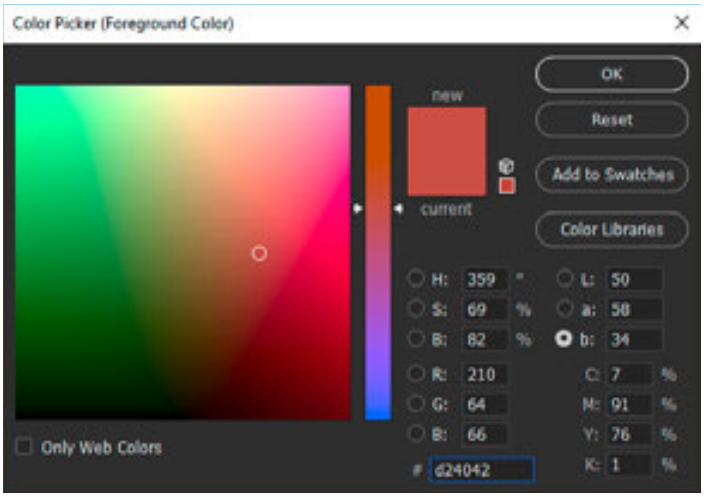
CIE-Lab color model and the positioning of the sRGB and AdobeRGB color space.

Admittedly, it is difficult to understand ***Convert to Profile*** and ***Assign Profile*** at first glance. At this point, a graphic that shows the color space sRGB and AdobeRGB in the CIE-Lab horseshoe and whose primary colors are assigned the device RGB values should help. Both color spaces can be selected in Photoshop and if you have a Wide Gamut monitor, the latter can also be displayed.

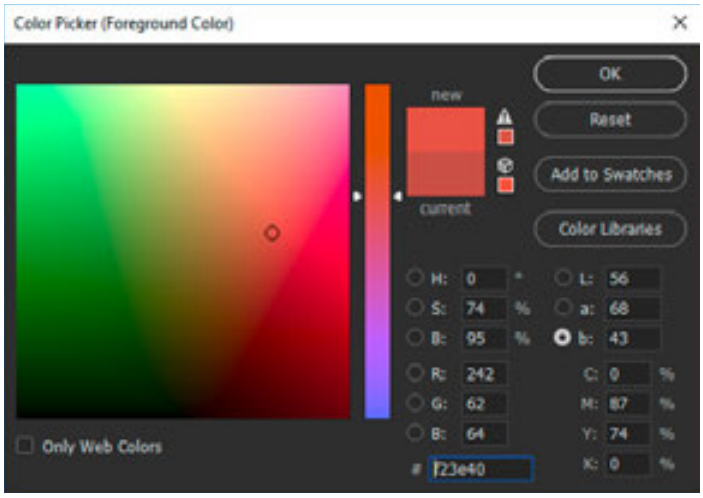
Take for example, the primary color green with the RGB values (0/255/0). It is obvious that the green in the AdobeRGB color space is a different green than in the sRGB color space, even though in both cases the RGB values are the same. For the “transform profiles” and “assign profiles” options there are two scenarios. Either the color remains visually the same, but then the RGB value adapts to the color space, or the RGB value remains the same, but then the color changes visually due to the changed color locations in the CIE-Lab color model.



The original image was shot in AdobeRGB. The color values refer to the color field F4 of the SpyderCHECKR.



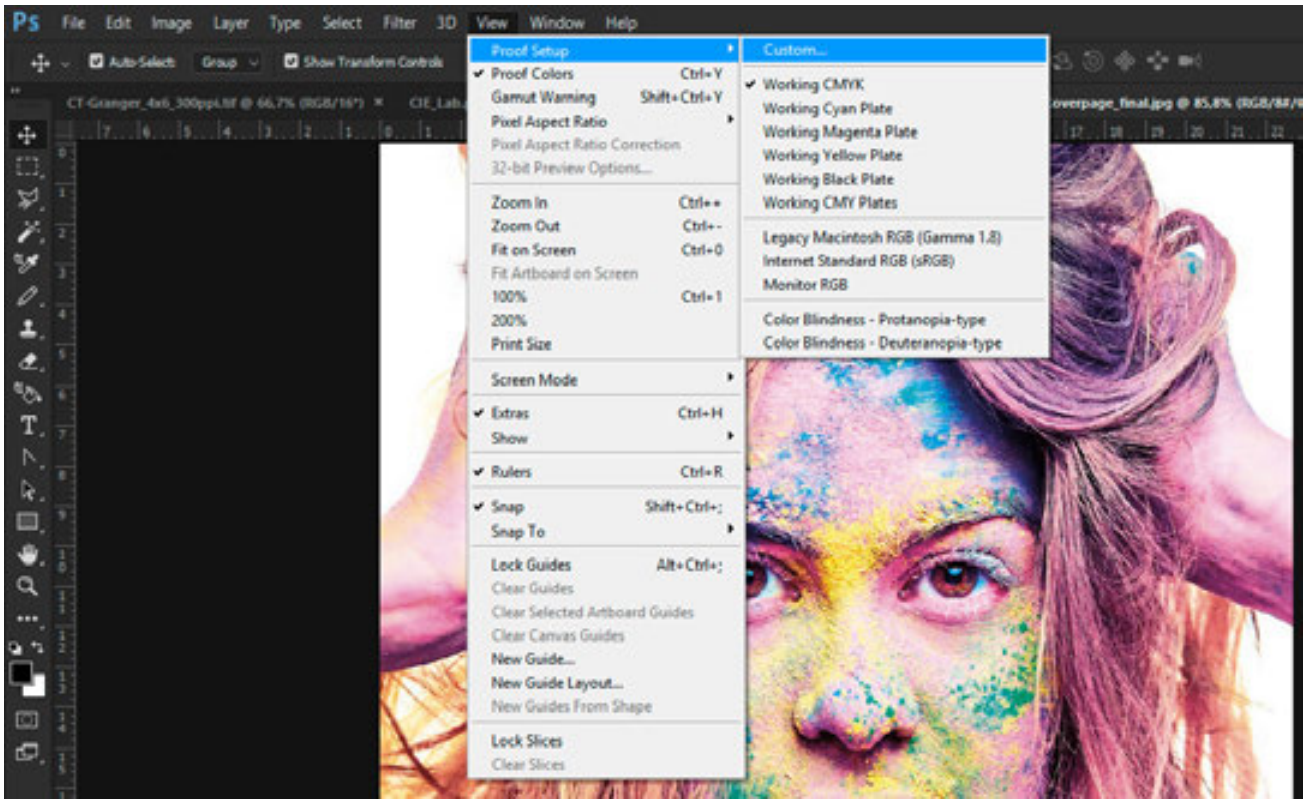
After the image was transferred to the sRGB color space using Assign Profile, the Lab values changed and the RGB values remained the same: same numbers, different colors.



Here the command Convert to Profile was used, to change the AdobeRGB image to sRGB and the colors was retained; the CIE-Lab values remained the same while the RGB values changed.

Using the Soft Proofing Function

The soft proof feature simulates your print taking into account the unique characteristics of the printer, inks, and the paper used.



You can access the Proof Colors function via the View menu. There you can select the output profile for your soft proof.

Making soft proofing simple

Use the Custom command under Proof Setup in the View menu, to define the printer profile for your print output.

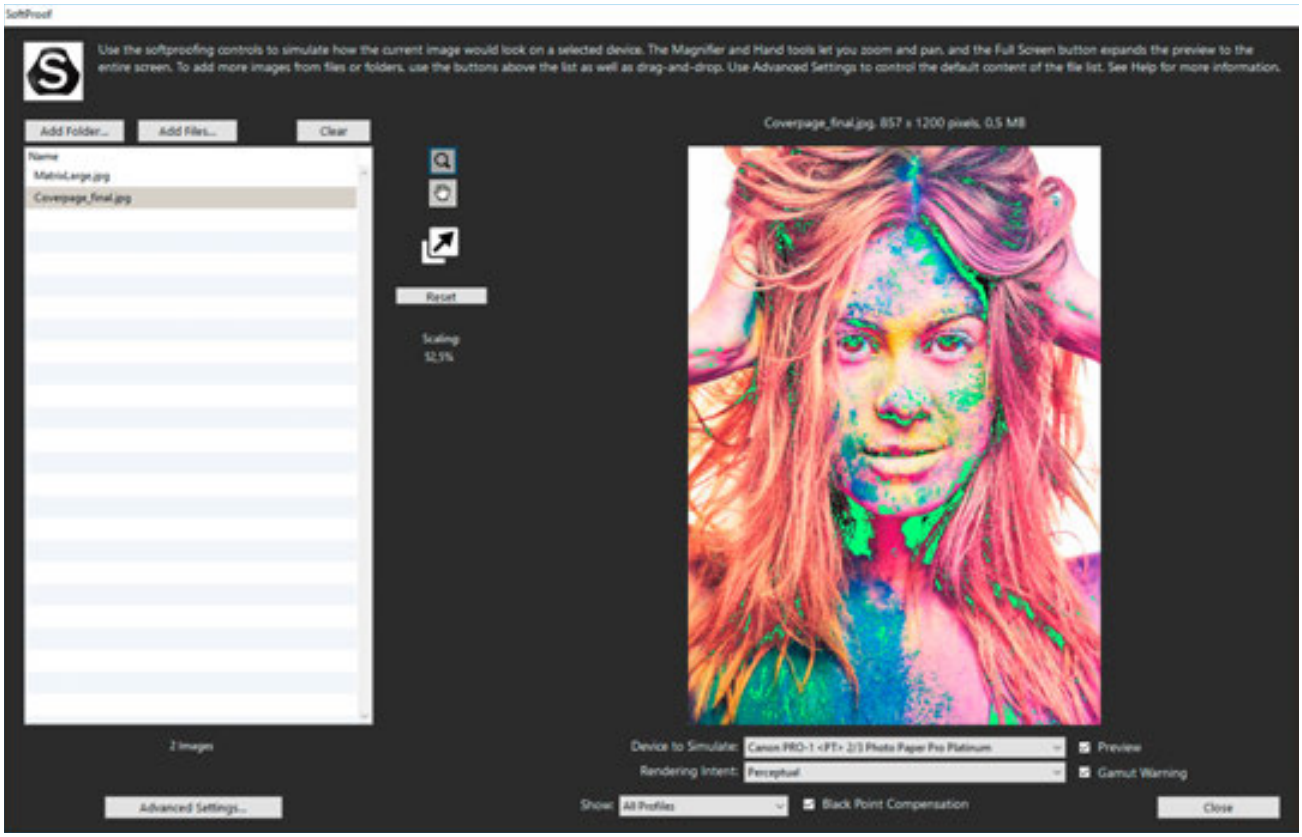
Make sure that the Color Range Warning is enabled, so you can see which colors will change most. This function is particularly helpful for editors with less experience.

Finally, you must develop a feeling for which colors can be printed without losses. If you want the soft proof on screen and the final print to be as closely matched as possible, select Simulate Paper Color and get an Absolute Colorimetric print preview. Not only is the paper color simulated here, but also the contrast range is reduced to such an extent that it looks very close to the color contrast on a paper; which can be discouraging, but also useful.

Include service providers' profiles

We recommend Spyder5ELITE+, which offers a very easy-to-printer soft proofing simulation. If you would like to assess the printing colors of a service provider before sending out for prints, download the corresponding profiles from their website. There should be profiles available for each paper type offered. With a size of approximately 1 MB, the ICC / ICM files can be quickly downloaded. For them to be used for printer color simulation, they must be installed in the correct system folder. The Spyder5ELITE+ software makes this process particularly easy.

Just click on Install Profiles and select the downloaded profile files in the opened file browser. After clicking on Next, the external printer profile is already integrated and can now be used in the Soft Proofing function. To view your own images via the print preview, simply drag and drop the image file into the left-hand image list. Here the Color Range warning is selectable and a subfolder can also be selected in Advanced Settings.


SoftProof
Use the softproofing controls to simulate how the current image would look on a selected device. The Magnifier and Hand tools let you zoom and pan, and the Full Screen button expands the preview to the entire screen. To add more images from files or folders, use the buttons above the list as well as drag-and-drop. Use Advanced Settings to control the default content of the file list. See Help for more information.
Add Folder...
Add Files...
Clear
Name
MatrixLarge.jpg
Coverpage_final.jpg
Reset
Scaling:
32,5%
Coverpage_final.jpg, 857 x 1200 pixels, 0,5 MB
2 Images
Advanced Settings...
Device to Simulate:
Rendering Intent:
Perceptual
Preview
Gamut Warning
Show:
All Profiles
Black Point Compensation
Close

Soft Proofing with the Datacolor Spyder5ELITE + software

Postprocessing in profiled view

The options you have

Since you can also edit images in this print preview, the effects of color or filter corrections can be assessed in a final way. This allows you to:

- Fine-tune an image copy (never the original) specifically for a specific print media
- Saturate or desaturate critical colors before printing
- Intervene in the event of unexpected color or contrast shifts

EXPERT KNOWLEDGE

In contrast to editing after a CMYK conversion, all filters and dialogues that only work in RGB, such as Same Color, are available here.

Gamut Warning

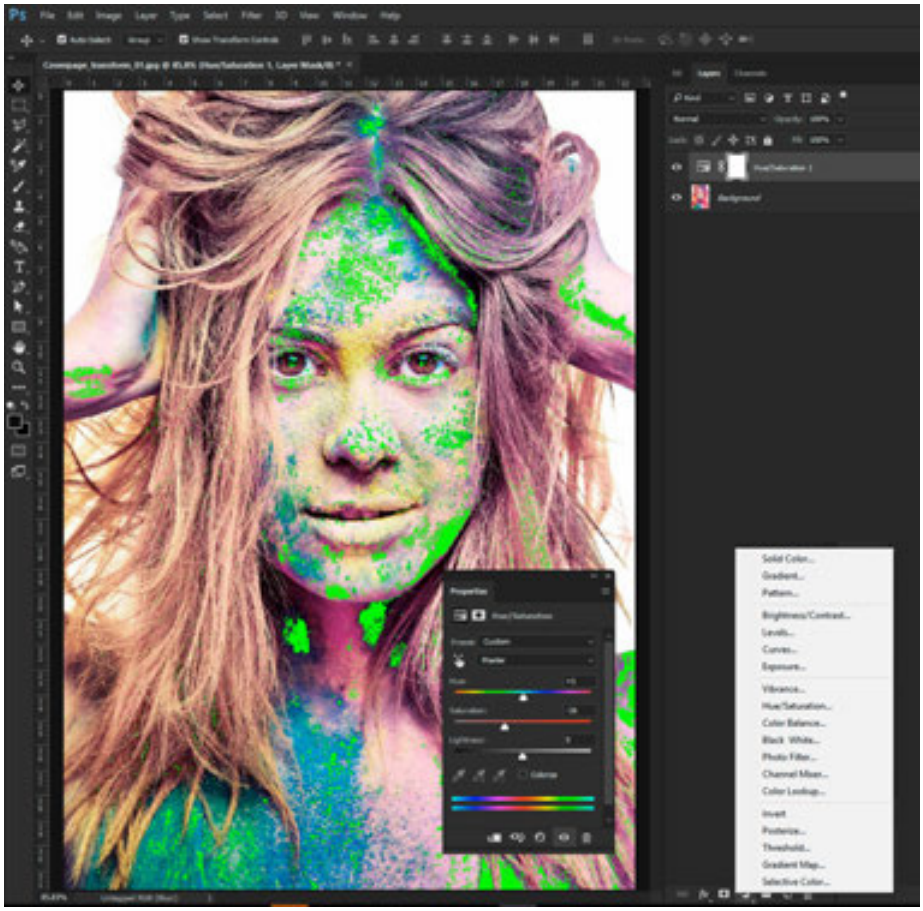
What this notice means

In the case of minor changes, the Gamut Warning function from the View menu shows the problem areas that arise when converting to the printer color space. In this case, an indicator color overlays all areas of the file that cannot be printed as intended. You can define this indicator color in Photoshop's settings under Transparency and Gamut Warning. In the Spyder5ELITE+ software, this is done under Advanced Settings.

We compared the original image with two soft proof images and their gamut warnings. FOGRA39 (ISO 126476-2: 2004), a widely used standard in offset printing is used. The second profile belongs to the Canon Pixma Pro1 on Pro Platinum paper. It is a 12-color photo printer. Clearly, the Canon printer can display more of the original colors from the AdobeRGB color space.

How to transfer unprintable colors into the output color space

The moment you activate the gamut alert and see some areas that cannot be printed, you immediately ask yourself what to do with the unprintable colors? In principle, it is quite simple, but it certainly requires some practice and experience. If you use the tools for image optimization such as saturation, exposure, hue, etc, you can immediately see how the areas highlighted in color by the Gamut Alert change. It is not necessary to banish the targeted colors completely from your picture; they should no longer be totally flat, even if some small details still exceed the printer gamut.



After eliminating the target areas as much as possible through the image enhancement tools (here: Hue, Saturation, Brightness), it is best to save the image under a unique name; perhaps indicating the printer and paper it is adjusted for.

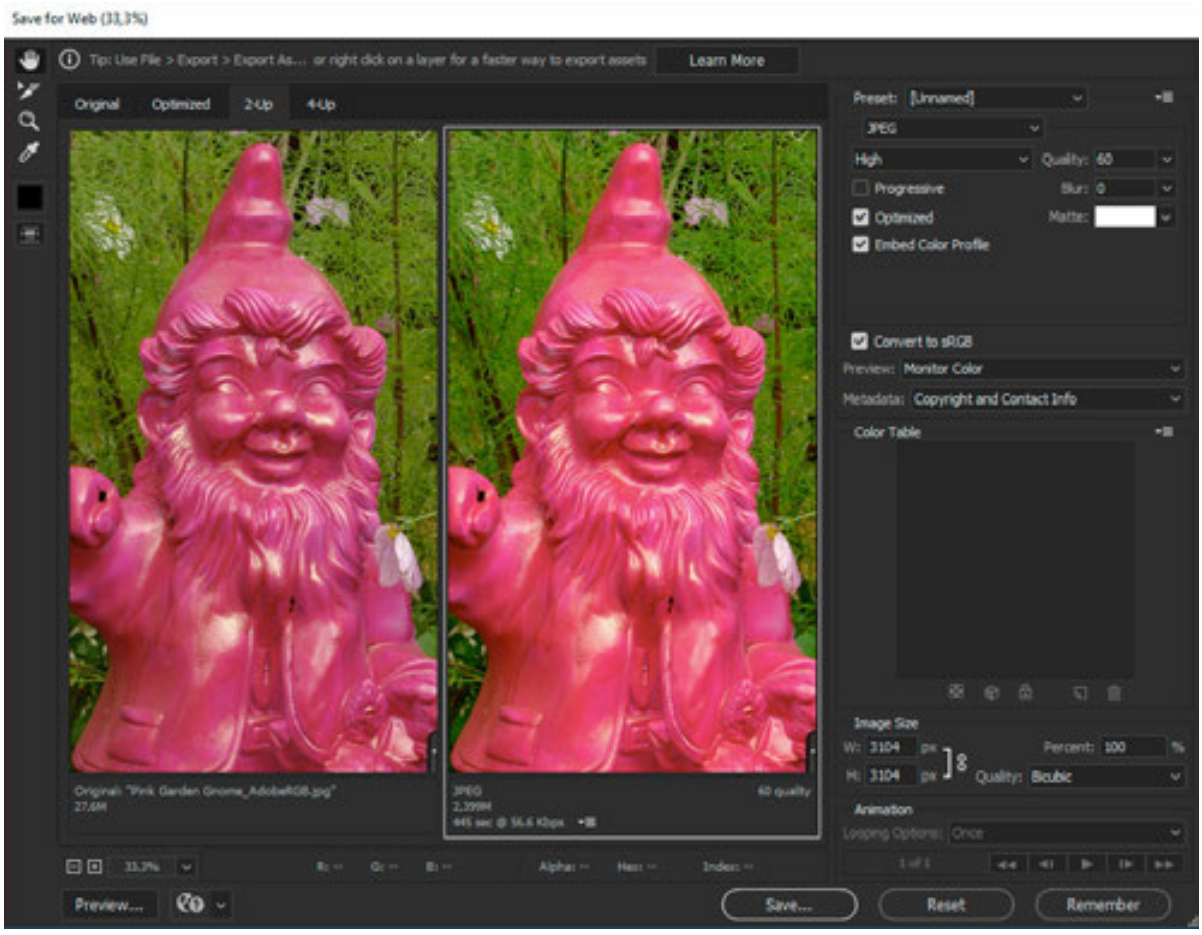
TIP

For image enhancement in Adobe Photoshop, use smart objects. These can be found in an array of small icons in the lower right area of the desktop. The benefit is that you can make changes to the image without changing the source file data. On the other hand, if you edit your image using the tools that you access via the "Image / Adjustments" menu bar, this is destructive and irreversible; so a new copy must be saved.

Web-Proofing

What you should observe

The colors of your images can look very different online. This depends on the operating system and monitor you are using. The three preview variants are shown in “View> Proof Setup> Macintosh RGB, Windows RGB, Monitor RGB.” For use on the Internet, you should always work in the sRGB color space and, if necessary, convert the images from the original color space to sRGB. In the Save for Web dialogue of the Photoshop Export options, you will find a Convert to sRGB option which you can use. In the same window, please also enable the option Embed Color Profile, such that the JPG file saved contains the information that the color values are in sRGB. For correct color prediction, you must switch to Internet Standard RGB in the preview. Because only then do you get a realistic impression of how others view the images.

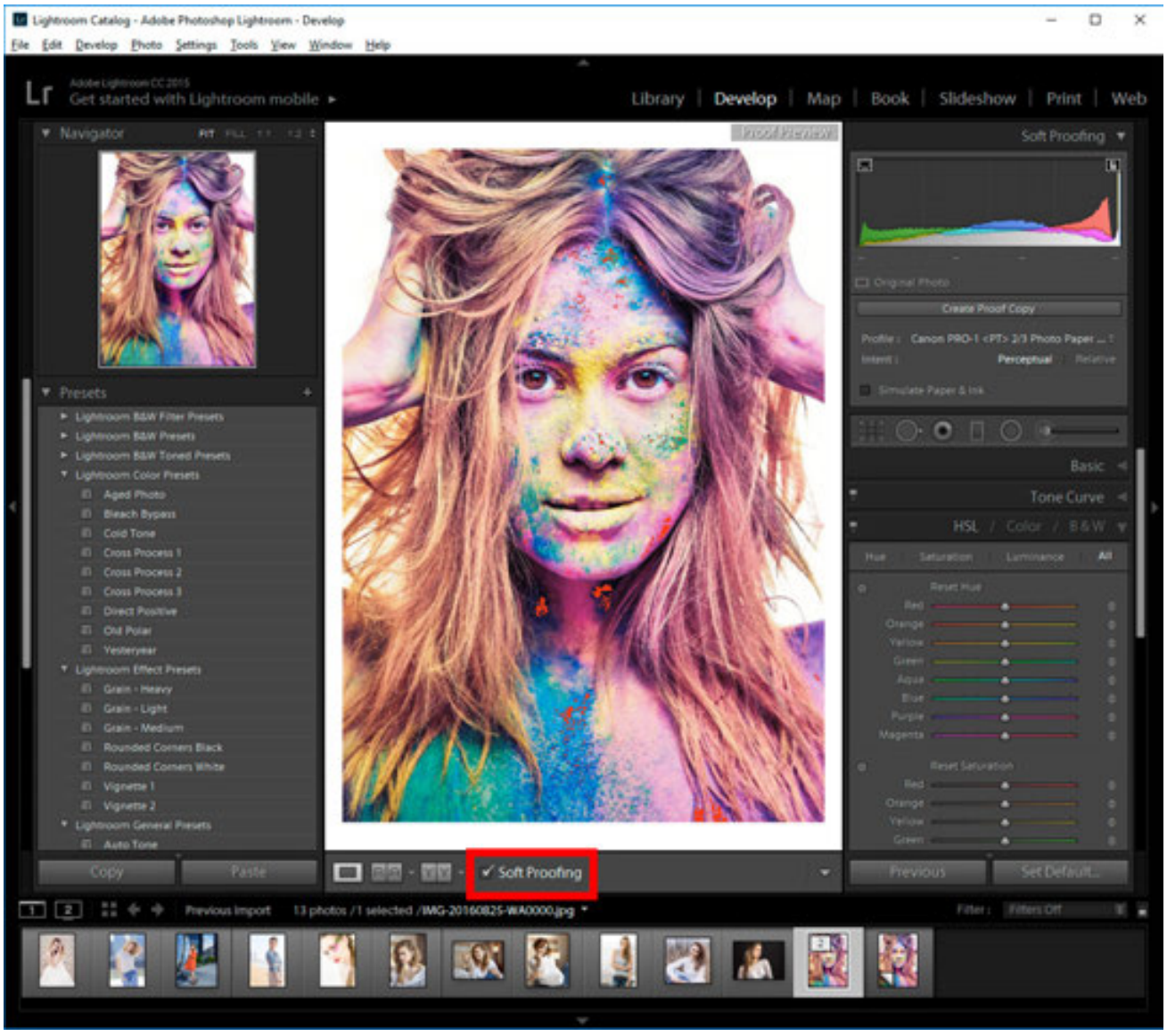


You can clearly see the different pink tones in the original and in the image converted to the sRGB color space.

Soft Proofing in Lightroom

Setting up soft proofing

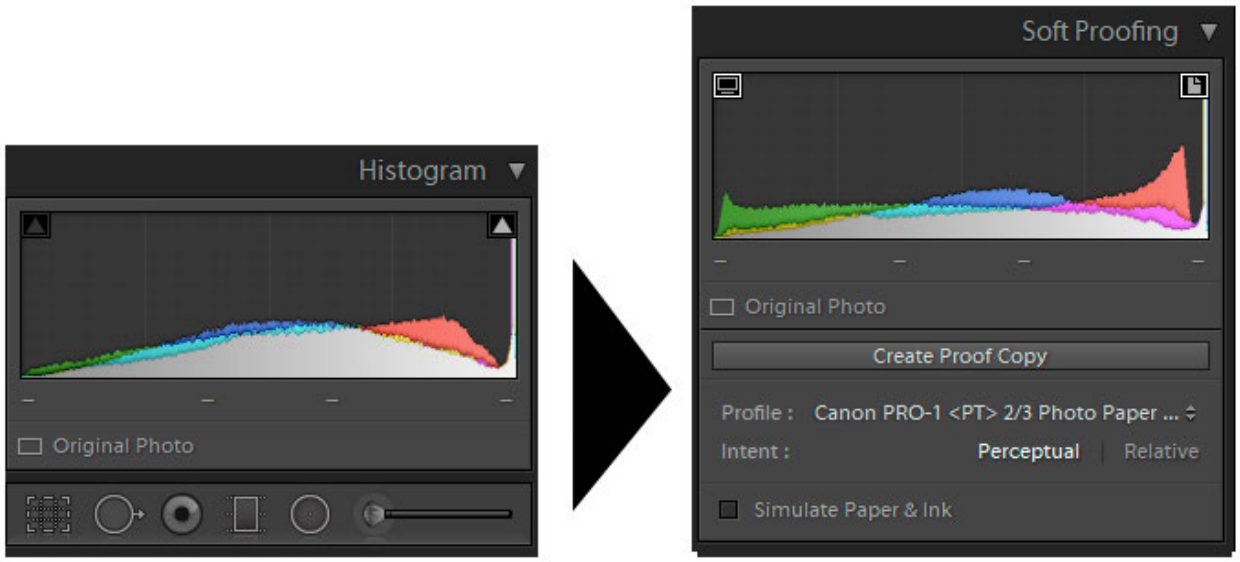
Starting from Version 4, Lightroom has a very good soft proofing function. You activate this by clicking the Softproofing checkbox in the Develop Module at the bottom of the work window. You can now display the preview based on profiles and choose between two rendering intents. This is how you enable the monitor proofing view:



The checkbox of the softproof function is outlined in red in the picture.

- Select the Develop module. Click on the checkbox which is located at the bottom of the Develop screen
- Then, the Histogram section is changed to Soft Proof
- Now, you can assign a profile, select the rendering intent, and enable the simulation of paper and ink

The changes have a direct effect on the display of the image in the preview window, which is now marked "Proof Preview."



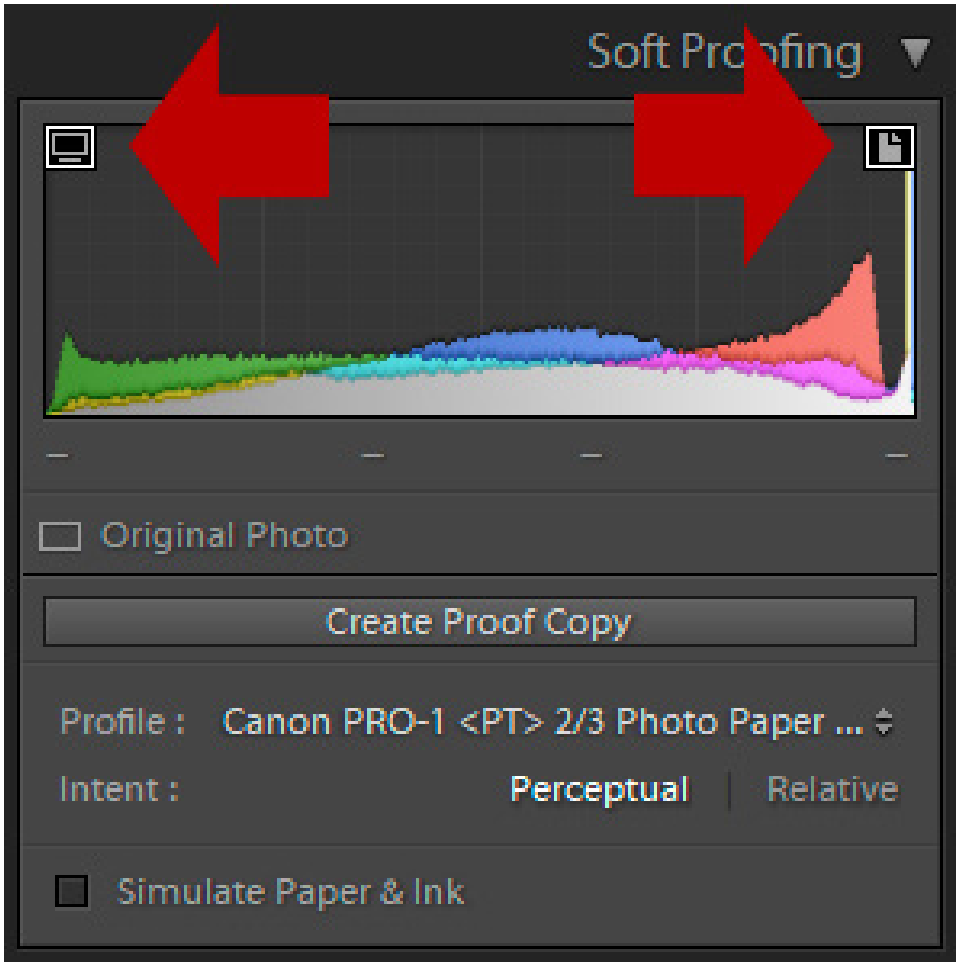
After activating the checkbox "Softproofing" the histogram of the output format will be displayed. In this setting, you can select the desired output settings.

TIP

If you make changes to the image in the proof preview, you can save this image variation as a virtual copy.

Gamut warning options

To check whether the colors in the image are changed during screen or print preview, activate the two warnings for the target color range and monitor color range by clicking on the icons in the histogram, or from the View menu under Soft Proofing.


Soft Proofing
Original Photo
Create Proof Copy
Profile : Canon PRO-1 <PT> 2/3 Photo Paper ...
Intent : Perceptual | Relative
Simulate Paper & Ink

The buttons to activate the gamut warnings are very inconspicuous, but important.

INTERESTING ONLINE FINDS

Check out this tutorial on soft proofing with Lightroom Softproofing.

Read Article

The Art of User-Printing

What you should know

For a long time, inkjet printers were barely able to print photos of the same quality as those from a photo lab. The quality of user-printed photos became acceptable only with the advent of six to twelve color printers. Now there are an increasing number of papers that can absorb all that ink with baryta prints, the benchmark used in the analog lab.

The Canon Pixma-Pro-1 is a 12-color fine art inkjet printer. It is representative of this device class. Inkjet printers with 12 inks can print colors far beyond the traditional CMYK offset printing gamut, so are excellent for fine art printing.

This output technology is equally interesting for both advanced amateurs and professionals. Hobby photographers spare themselves hours in the darkroom, and achieve their goal faster and more reproducibly, due to digital image processing. Professional photographers need less space because the darkroom is replaced by a desk. Here, they can implement corrections or editing requests from customers – even in front of them. Digital saves a lot of time, as well, thanks to the direct processes, which do not require any development or drying.

INFO

Unfortunately, what can be captured by the camera and displayed on the monitor cannot be physically transferred to the print. Such restrictions are not new to photographers; even with negatives, only half the captured image information ended up on the paper In contrast to the digital process, it was much more difficult, even for experienced photographers, to predict accurately which colors and which details would make it to paper and which would not.

The Technique of Printing Your Own

How to get high quality images

If you follow the steps below while working on a computer, you will be able to achieve results with inexpensive photo printers, which would previously have only been possible for an expert photo specialist:

- Create your **profile** carefully
- Do not scrimp on **paper quality**
- Correct images in **soft proof mode**
- Compensate for **sharpness losses** when printing, using your experience or a specialty tool

However, for the perfect print, some settings details explained on the following pages must also be considered.

RGB Print Output

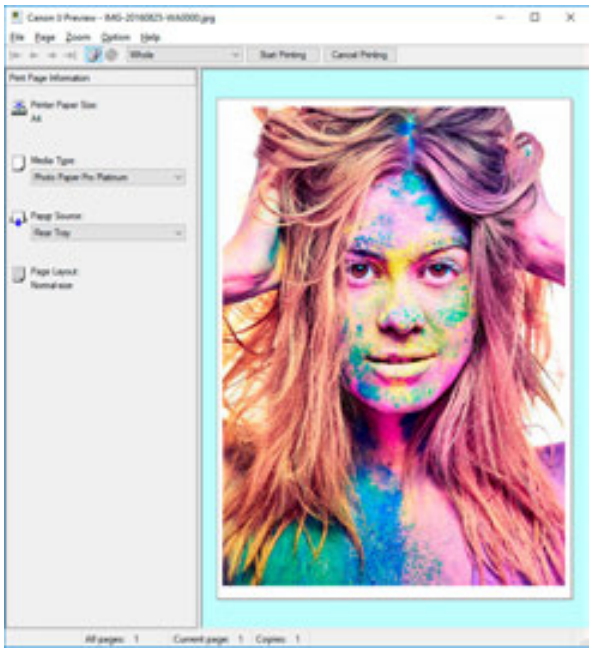
What to look out for

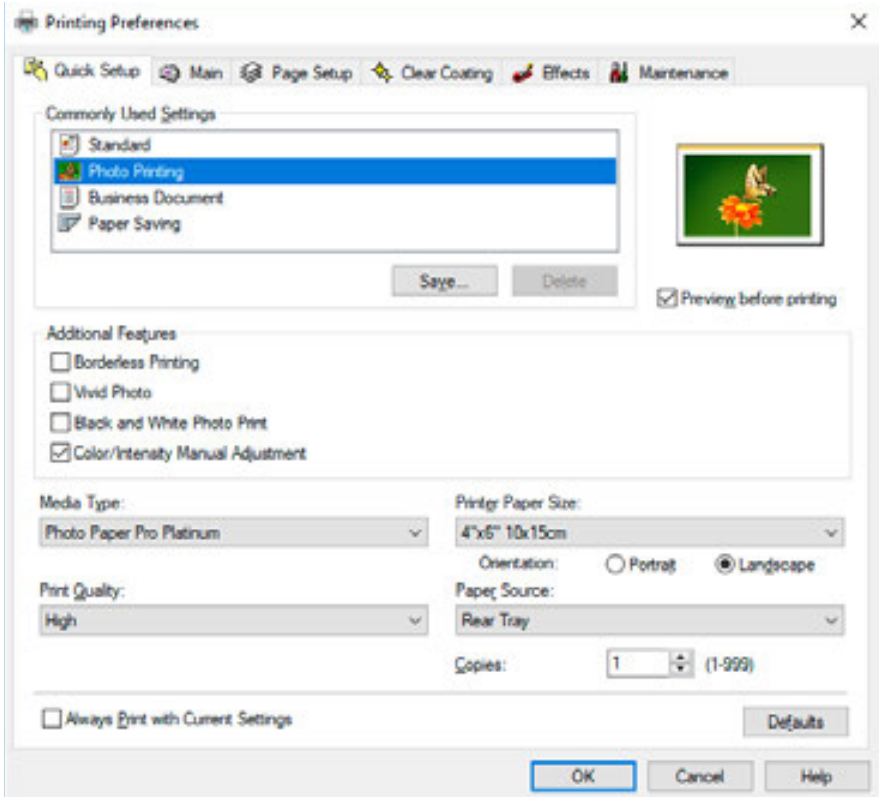
If you are printing your images on a photo printer, the photos must be sent to the printer in RGB. This is not a printing space, but a color mode, that meets the needs of RGB printers to correctly process to the ink colors. The final ink channels separation is carried out by the printer driver. All you have to do is specify the settings in the Photoshop Print dialogue, and make sure that the following is set in the options:

- Color handling – colors managed by Photoshop
- Printer profile – the generic profile for your paper, or, better, your user-created profile
- The same for rendering intent that you selected under Soft Proofing

TIP

Note that the printer driver default setting is used to disable its own color adjustments.





This image shows Print Preview in the printer driver, as well as the disabled color adjustment in the advanced setting of the printer driver.

Service Provider Prints

Save money and avoid disappointment

Nowadays, print service providers offer a variety of products that one could not have imagined 10 years ago, and were formerly reserved for professionals. They were known, if at all, only from galleries. The range includes high-quality photo books, photo prints on clear acrylic, aluminum dibond or canvas, and other options. The number of formats has also become confusing and even includes large panorama formats. This wide range photographic products also show photography's popularity, that it is no longer just a means of capturing memories. Many people now use photography as an expression of their individuality, and they hang up personal, detailed, elaborate images of gallery quality on their own walls.

As beautiful as these products are, there is a high risk that the colors and details that have been developed though painstaking work will not be reflected in the final images as desired. Not to mention the money invested, which can quickly run into hundreds of dollars.

INTERESTING ONLINE FINDS

This guide from Breathing Color lays out how to choose the right paper for printing – what papers work best for certain images, what papers are top quality, and more.

Read Article ›

Color management and print service providers

Premium print service providers understand that there is no way for them to be competitive without color management. Complaints arise when an expensive image does not live up to expectations. Quality service providers now offer ICC profiles to download for your use, so you can soft proof on your own screen. This is a step in the right direction.

Three issues can still lead to dissatisfaction:

- The higher the quality of the ordered image, the greater the likelihood that the image has been digitally reworked. If this happens on an uncalibrated monitor, the colors are assessed and processed blindly. It is not clear which colors resulted. It is like wearing tinted sunglasses to assess your images. Soft proofing on the unmanged monitor, using the ICC printer profiles of the service provider, offers only half the solution .
- The customer may not bother to softproof with the ICC profiles of the service provider, despite having calibrated monitor; perhaps assuming that calibrating the monitor is all that's needed.
- The printed image is too dark and the shadows are clogged. Most users are unaware that a monitor has a contrast range as much at ten times are large as a print. Because of this, if the brightness of the monitor has not been reduced to a level relative to the printer, screen details which cannot be reproduced in print will be lost. Monitor calibration with ambient light analysis by tools like Spyder5PRO or Spyder5ELITE is needed.

INTERESTING ONLINE FINDS

A survey conducted together with the Systemkamera-Forum, the Leica Forum and the Fujifilm Forum revealed the following:

61% of the 750 participants had already used a print service. Of these, 57% had already ordered a photo book and 41% ordered larger formats on aluminum dibond or similar material.

However, it was interesting to note that 23% had problems with color and 17% complained about clogged shadows.

The complete report can be viewed here:

Read Article

Paper, Canvas and Film

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How different print media affect photo printing

At one time, photo orders were like take-out food orders: “Please print 18 copies of number 13.” The only query was: “Glossy or matte?” Even today, most photographers opt for glossy. Why? Because they have little or no experience at all with matte media. Their reasoning is that the colors should be as brilliant as possible in the image; that the additional brilliance of gloss can‘t hurt. If you follow this logic, you will get good, but not always optimal, prints. What is often overlooked is that sunny images must shine, but the surface gloss does not always emphasize the intent of the image content. Prints of a rough landscape look more impressive when presented on textured materials, such as canvas or watercolor paper. The choice of the print media is about print size and image content – at least for those who understand the nuances and use them to create more powerful prints.

EXAMPLE

Fine art prints seldom involve glossy paper surfaces. The artist wants to produce as much detail as possible. The shiny surface is not optimal for this, since it acts as a subtle contrast enhancement. Fine art printing is based on matte media, but there are many different products with subtle variations that are hard to distinguish at first glance.

What papers should you use for photo printing?

In the past, the home printer in their darkroom would have to choose between only glossy, satin,or matte, when creating chemical photo prints. One additional option was baryta paper, which is complicated to process and has to be heated in a dry press in order to produce its surface. All other materials, such as canvas, rice paper or watercolor paper were only available to insiders and specialized laboratories because of the high costs.

Today, owners of inkjet printers can print photos on any flat surface. Dedicated inkjet papers are recommended for most uses. But even here, the selection is larger than ever before. Apart from the classic glossy and matte style papers, there are also other choices, including canvas, felted and film. These are available in several different options, and weights.

Materials your own printer can use depend on:

- Whether the inks are compatible with the coating
- Whether the printer can handle very heavy or very light papers

INFO

Which papers you choose depends on image content and are a matter of experience. The more exposure you have, the more confident you will be in your choice of materials.

High-Gloss

What you should consider with glossy inkjet papers

Glossy papers are available in several gradations between high-gloss and silky. The high-gloss type is the most common for photo printing. The prints are very close to the appearance and texture of conventional photo prints.

Glossy papers allow the deepest blacks, highly saturated colors, maximum ink coverage, and a high maximum density. This produces crisp contrast. Unfortunately, these papers are very sensitive to fingerprints with their lacquer-like surface. For this reason, you should only touch them with gloves or have a non-printed border on the paper during photo printing. A glossy surface hinders the applied ink from entering the paper quickly. This means high-quality glossies can take longer to print (as the printer builds in drying time) and to cure after printing before stacking. While some papers are less problematic, others still require the slower unidirectional printing mode, in which printing is carried out only in one direction of the print head. This function must be selected in the driver interface, and profiles should be built specifically for this mode.

TIP

Glossy papers usually involve a coated polyester carrier layer. When hanging gloss images consider how their reflections of lights and windows in the shiny surface may impact viewability.

Matte

Matte photo paper offers you a range of possibilities

Matte papers appear much more reserved than high-gloss and thus give a more elegant impression. These surfaces can depict very delicate details. Because of their large printable color space and the excellent light and detail characteristics, matte media count among the favorite papers of many top photographers. They allow images shot at high ISO settings, to display sensor noise much like analog film grain, which can be very satisfying.

However, surfaces tend to be sensitive to moisture, which limits their durability. You should fix the prints manually with spray, if the printer does not do this automatically. Matte papers are available in matte, semi-matte, satin and pearl designs. The last three categories are moving toward glossy, though pearl extends the dull surface effect with a haptic structure.

Due to their ink absorption potential, matte papers allow ink to dry faster. If such prints are hung up to the wall, light reflections are not an issue, since the dull surface has a reflection-reducing effect. Fingerprints are not problematic with matte papers, which unlike their glossy counterparts, do not have a coated polyester carrier.

INFO

Matte papers require a special black for high-quality prints. Some printers require switching the matte and gloss black inks, others keep both inks ready at the same time.

Handmade Paper

What you should consider when working with handmade paper

Most people do not know that handmade paper can be used as photo paper. It is matte and often has a slightly structured surface. Originally, the term "handmade paper" was understood as consisting exclusively of paper that was made by a manual pulp process. Now, it can be produced using machines, which has made it more affordable. Due to the structure of the handmade paper, photo prints are given a particular feel and color aesthetic. Handmade paper is usually made from wood pulp, and is acid-balanced through buffering. It's ideal for artistic work. Rag paper consists of 100% of cotton, usually recycled, and requires no buffering. While rag paper is the finest and most expensive paper type, its share of total paper production is only about 2%.

Since handmade paper is available with various surface textures, this leads to uncertainty among some photographers: It is not easy to find out which surface works best for each print. If you are uncertain here, you should concentrate less on the textures of the varieties. Only a few photo styles benefit from a heavy paper texture. The interplay of colors usually determines the image impression and the subtleties brought to paper.

Fine Art Paper

What this type of paper is suited for

If you do not like typical glossy prints and prefer matte paper qualities, the world of fine art papers might be of interest. These are often heavy papers, the surface of which may have a more natural tone without artificial brighteners. Often very expensive, such papers usually have a fine, soft texture as well as a special touch. They can depict the finest details and are ideal for printing black-and-white as well as color photographs, and are used for art reproductions with high image depth.

For art photographers, it is an absolute must to print their work on materials that meet the highest standards. In recent years, there has been an almost unmanageable variety of papers in the high-profile segment that are presented as fine art papers. The best of them make a print from an original, that you would not only like to view behind glass, but also one that has tactile qualities. However, central to a fine art paper is print-life. Many years of color stability should be possible. Current inks do not all manage this, even if they promise a durability of at least several years.

Canvas

What you should know about canvas during photo printing

In the history of photography, there have been many attempts to establish textiles as photo media. But these fabrics only reached a significant market with the development of inkjet technology.

Genuine canvas is made of cotton without polyester content. There are two weave types:

- The typical **Linen** weave uses warp threads and weft threads interwoven with each other.
- **Twill** weave uses weft threads alternating over two or more warp threads, creating a herringbone pattern.

MORE INFO

Polyester-blend canvas is more affordable and available that cotton canvas. It has varying cotton/poly blends in typical weights of 10 to 12 ounces.

Canvas is usually matte, but glossy fabric coatings are also produced. However: inkjet printed canvas must not be heavily stretched, as it is when creating painting canvasses, or the inkjet coating will crack. Photo canvasses are very lightly stretched onto their backing. Canvasses are not protected by glass, so an additional protective spray or brush-on coating is important for protecting the ink.

EXPERT INSIGHT

Inkjet canvas is often used for oil or acrylic painting reproductions. There are processes in which special scanners with a custom artwork lighting unit produce digital scans of artwork. The results are then output on canvas and produce a very good imitation of the original work. Inkjet-coated watercolor paper is similarly used in reproduction of paper paintings.

Films

Film options for inkjet

Backlit films are a very common type. These polyester films can also be printed with inkjets. They receive their color saturation only through their translucency. Without a backlight, their look dull and unsaturated. Films can compete with paper for detail and dynamic range. Color saturation of films often exceeds that of paper. Consequently, backlit films are finding more and more followers in commercial POS, but also private, uses. Color accuracy in backlit films is problematic. A color shift occurs in the magenta and black layers due to the different thickness of the inks. You should therefore work with the special ICC profiles, which are designed for the material. Backlit film is usually printed on the back surface. This allows scratch-resistant fronts suitable for outdoor as well as indoor use. Indoor versions last about a year before excessive fading. Outdoor films utilize different solvents and curing systems for up to three years of life, but tend to have a lower scratch resistance.

There are also interesting **special forms of backlit film**:

- The first special form refers to self-adhesive, clear films that look brilliant on their own when they are adhered to white acrylic. Backlighting intensifies the effect but is not absolutely necessary. Such films are used mainly in bright interior spaces which are also utilized at night.

- Self-adhesive window films constitute another special form, and are best known from Christmas decorations. They can be used to dress up unattractive spaces by partially or completely covering the windows to resemble stained glass. The films can be used several times, so that decorations can be changed with the seasons.

There are also **metal films**, typically in copper or aluminum, that produce the effect of old or very high-quality photographic processes.

Glossary

AdobeRGB (1998):
The AdobeRGB color space was specified by Adobe in 1998. The objective was to create a color space from which the CMYK color space of a color printer could be adapted to the RGB color space of a monitor. It is larger than the sRGB color space.

Bayer filter:
Photo sensor named after its inventor Bryce E. Bayer. The sensor is overlaid with green, blue and red filters, which are in a ratio of 50 % green, 25 % blue and 25 % red. In this way, it approximates the sensitivity of the human eye, in which green accounts for the greatest share of the perception of brightness.

Border shadowing:
See objective vignetting.

CCFL display:
This is a first generation flat screen. CCFL stands for Cold Cathode Fluorescent Lamp. In contrast to today's monitors, which are illuminated with LEDs, the CCFL displays produce light using neon tubes.

Cd/Candela:
Candela is the SI unit of the SI basic variable of luminosity.

CEPS tools:
CEPS stands for Color Electronic Page Setting. In photography, this involves photo retouching or photo editing with the aid of image editing programs such as Adobe Photoshop or Adobe Lightroom.

CIE-xy color space:
The CIE standard valence system has been defined by the International Commission on Illumination (Commission internationale de léclairage). It is the link between human perception and physical causes.

CMOS technology:
CMOS stands for Complementary Metal Oxide Semiconductor. This involves semi-conductor technology, which has become widespread in photo sensors, etc. CMOS sensors are primarily characterized by low power consumption and short switching times.

Color balance:
The color balance determines the ratio of the colors to each other. For example, if the colors in a recorded image are not reproduced as they are in the original, the colors are not in balance.

Color fidelity:
Color fidelity is the measure of the deviation or the similarity of colors during recording and output. Color management systems are normally used to achieve maximum color fidelity.

Color fringes:
Color fringes, also called chromatic aberrations, occur in images because of deviations of optical lenses. Because the individual wavelengths of the visible spectrum in a lens are refracted differently, each wavelength range has its own focal point. In practice, this leads to color fringes, which are particularly visible on the contours and edges of an image. This error can be corrected using additional lenses, which are attuned to the respective wavelengths.

Color homogeneity:
The color homogeneity describes the color consistency or the color deviations from a set point over an area, e.g. the surface of a display. In the case of poor color homogeneity, the same color value is reproduced differently on the surface of the display. For example, this could cause a green tint on the upper right and a red tint on the bottom left corner.

Color noise:
Color noise, or image noise, describes the deterioration of image quality due to structures, which themselves do not carry any image information. The impacted image sections deviate from the actual image information in terms of color and brightness, and are especially visible in dark areas of the image in which the signal-to-noise ratio is very low.

Color separation:
In the prepress stage, this means the conversion of the colors of a wide variety of image datasets, mostly to the CMYK color model. The colors are separated into the print colors cyan, magenta, yellow and black.

Color space:
A color space is a defined range of colors. The best-known color spaces from the RGB color model are sRGB and AdobeRGB (1998), as well as the CMYK color model, Euroscale Coated v2, Fogra39 and ISO Coated v2.

Color temperature:
The color temperature describes the light mood and is specified in Kelvin. A cooler light mood (bluish) prevails, for example, in a cloudy sky, than in sunshine (yellowish).

Contrast:
Contrast is the ratio of the brightest to the darkest area of an image.

Contrast balance:
Is the ratio of the brightest and darkest areas and defines from where the light is being drawn.

Cross-effect:
The cross-effect originally came from analogue photography, in which a slide film was combined with a negative development process or a negative film with a reverse development. The colors are artificial and the contrasts are higher. This effect is often used for artistic styling and is imitated today by digital techniques.

Contrast ratio:
See contrast.

DLP projector:
DLP stands for Digital Light Processing and it is a technology developed by Texas Instruments where the image is created by an array of micro mirrors within the optical path. A special feature is that the red, green and blue pixels are not generated simultaneously (as in LCD projectors), but quick alternate flashing through a rotating color filter wheel.

Glossary

ECI RGB:
The ECI (European Color Initiative) RGB is a standardized RGB color space, which covers a large part of the printing processes, as well as all currently known display technologies. Thus, it is a color space that is designed especially for the needs of the graphic arts and prepress.

eciRGBv2:
Further development of ECI RGB. It has been optimized in terms of the visual equidistance, as is known from the CIE-L a*b* color space. This results in a minimization of banding and clipping errors, as with the L-Star color space. The ECI recommends using the color space as early as data creation, for example when converting RAW data or 16-bit material to 8-bit color depth.

EXIF information:
The Exchangeable Image File Format (EXIF) is a standard format for saving metadata in digital images. EXIF information can be, among other things, a camera model, shutter speed, ISO value, aperture or date and is written to the header of the image file.

Fine Art Printer:
There is no uniform definition for the term Fine Art Printing. All Fine Art printers attempt to create an image which most closely resembles a one-of-a-kind or work of art, in terms of its properties, selected motif, and post-editing, and in the use of the best photographic materials.

Gamma:
In relation to a monitor, gamma refers to the modulation of an input signal to a desired output signal. In practice, this means that a low-contrast image is obtained by correction of the output signal to contrast.

Gamut:
Is the description of the color range which can be reproduced by a technology or a technical device.

Gray balance:
"Achromatic" colors are the gray shades that lie between white and black. These are produced by equal proportions of the respective primary colors such as cyan, magenta and yellow (CMY) in the print or red, green, blue (RGB) in self-luminaires. If the primary colors change to equal proportions, a gray may become brighter or darker, but remains neutral gray. If the color components are no longer in the same proportion, one can immediately perceive a gray tint and gray balance is no longer maintained.

High-Key Image:
In high-key photography bright tones, few contrasts and soft light lend style to an image.

ICC profile:
An ICC profile describes the color space of input and output devices such as printers, scanners, digital cameras or monitors and refers to the reference values.

IPTC conventions:
IPTC is the acronym for International Press Telecommunications Council. As per the IPTC convention, metadata is saved to the header of an image file for improved classification. The metadata contains such things as parameters such as file format, file size, filename, height and width in pixels of a file, date recorded and the description of the contents.

Kelvin:
Kelvin is an SI unit of temperature measurement. It is also used for measuring the color temperature.

L*a*b* color space:
Is a device-independent color space and describes all perceivable colors equally, so that color deviations can be described by a Delta E.

LCD:
This refers to Liquid Crystal Display. The liquid crystals regulate the light impermeability per color channel. LED monitors are also LC displays, but irradiate the color filters from the rear with LEDs instead of fluorescent tubes.

LCD projectors:
The white light of the projector lamp is split into 3 basic colors by a prism and then sent through 3 LC displays, which control the image information per color channel. Subsequently, the image is put together by another prism. LCD projectors are characterized by a smaller contrast range, but can reproduce the colors very differently.

Low-pass filter:
With image files, so-called Moiré effects may occur instead of very fine recurring structures, which are at the limit of the sensor's resolution. These small, colored structures have a specific pattern, but are not part of the image information. Low-pass filters are used to prevent these phenomena.

L-Star RGB:
A modern color space, which combines the advantages of a higher color resolving power of the human visual sense of the CIE-LAB color space with the usual RGB color spaces like AdobeRGB and ECI-RGB. Banding and color tipper errors are reduced to a minimum when viewed on a display and in printing.

Luminance:
The luminance describes the brightness of image points
Luminance homogeneity:
Describes uniformity of brightness for a defined area. A poor luminance homogeneity of a monitor can be seen as vignetting, although all image areas must be equally bright.

LookUp table:
IT term. LookUp table (also called LUT) are tables in which application-specific values are stored which are used in a program routine.

Glossary

LUT:
See LookUp table.

Luv color space:
A color space that is calculated from the CIE-XY system, similar to the L*a*b* color space. This system is mainly used for the evaluation of light sources or monitors.

LED backlight:
This refers to a flat radiator that consists of many light emitting diodes and is used for the background lighting of an LED display.

Low-Key image:
In contrast to high-key photography, low-key photography uses little light as a stylistic device. Light is used consciously to accentuate highlight contours and the few details that are important for the image. Many sections of the image often remain in the dark. This lends a certain amount of drama to this type of image, a familiar sight in theatrical or stage photography.

Objective vignetting:
Vignetting refers to the shadowing of the image to its borders, which can be highlighted by components of the objective, such as lens mounts, and by filters or lens hoods. The effect itself is originally unwanted, but it is also used as a stylistic device.

Offset printing:
A printing method, in which the pressure roller does not directly contact the printed product, but the printing is transferred indirectly by a rubber roll. This is the most common method for printing books, newspapers, and packaging.

OSD:
Stands for On Screen Display and describes an input menu window of a monitor, which is shown on the display.

Primary colors:
Primary colors are the basic colors that compose secondary colors. Thus, the colors that a monitor can display are composed of the colors red, green and blue. The same applies to cyan/magenta/yellow, by means of which all colors which can be displayed by the process are mixed in printing.

Polarization layer:
A polarization layer, as used in LE and LC displays, ensures that light is polarized, which means only the fractions that oscillate in a plane are transmitted. This is the prerequisite for the option of regulating the light quantity per pixel with LCs.

Reflection idiosyncrasies:
Printing paper and photo paper have a large number of surface properties. The bandwidth ranges from matte and glossy to a wide variety of textures and materials. Every surface and material has very specific characteristics, with regard to how they absorb and reflect light. These must be taken into consideration when setting up a color workflow.

Rendering Intent:
The way in which the colors must be converted from one color model into another.

Softproof:
In a softproof, the colors on a monitor are simulated as they will appear on the selected output material. Also know as ink color simulation.

sRGB:
Standard RGB is also a color space developed by Hewlett-Packard and Microsoft. It is widespread, but smaller than the AdobeRGB (1998) color space.

THM file:
THM files are miniature view video files, which are used to create a thumbnail image (miniature image) of the video file for improved orientation.

Tonal value:
The tonal value describes the measure of tone scales. For example, a digital camera with 8 bits per color channel has a tonal value reduction of 28 = 256 steps per color channel.

White balance:
In the case of a white balance, a camera should be set to the color temperature of the recorded scene to keep the color balance neutral. This is also done by the human eye, which evaluates colors in a largely neutral manner.

White luminance:
White luminance is the maximum brightness of a white point that can be displayed by a monitor.

White point:
The white point defines the white of a monitor with full control.

Wide gamut:
Gamut is the displayable color space of a monitor. Wide gamut features a device class that is characterized by a very large color space that is close to AdobeRGB (1998) or even slightly more. Monitors with wide gamut are typically used in image editing.

Workflow:
A workflow in photography includes all devices and technologies, which are used in the processing of the final image. A typical workflow includes a digital camera, image editing software, display units/monitors, and printers.

Spyder5 eBook

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